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Lund, Jens Friis

Publication date:
2004

Document version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Lund, J. F. (2004). *Participatory Forest Management and Poverty: Distributional Effects of Participatory Forest Management in Tanzanian Miombo Woodlands*. Copenhagen: Royal Veterinary and Agricultural University, Unit of Forestry. Forestry discussion paper, No. No. 45

Participatory Forest Management and Poverty
– Distributional Effects of Participatory Forest Management in Tanzanian Miombo Woodlands

Jens Friis Lund
Centre for Forest, Landscape and Planning
The Royal Veterinary and Agricultural University
Rolighedsvej 23
DK-1958 Frederiksberg C
Denmark

Abstract
In Tanzania local forest management is implemented as a means to fulfil the dual objective of furthering rural development and arresting forest degradation. With the growing focus on alleviation of rural poverty, investigation of the distributional aspects of local forest management has become of interest. This paper seeks to investigate and discuss these distributional effects. This is done by analysing accounts of forest revenue collected by fifteen villages implementing local forest management in miombo woodlands north of Iringa town. The information in these accounts is combined with a case study in one village lying within market distance of woodfuel products from Iringa town. The findings indicate that villages situated in miombo woodland areas within market distance of a largish town may benefit from implementing local forest management in terms of a substantial inflow of cash from sources external to the village in the form of forest revenue. It is, however, also noted that the benefits may depend on resource characteristics, local wood consuming industries, distance to markets and institutional relationships. Furthermore, the effects on individual level are rather uncertain and highly affected by the implemented rules of access to and appropriation from the woodland.

Keywords: Poverty, Woodland, Community.

1 Introduction
In the past decade the Government of Tanzania (GoT) has, in pursuit of the dual objective of arresting forest degradation and furthering rural development officially supported devolution of ownership and management responsibilities over forest resources to local communities under the colloquial term Participatory Forest Management (PFM)[1] (MNRT 1998, URT 1997, Wily & Dewees 2001). Along with the legislation passed as part of the overall Tanzanian decentralisation process, the forest policies and legislation passed in the last few years allow for ownership and management responsibilities over forest resources to be transferred to local communities (MNRT 1998, URT 1982a; 1982b; 2002).

It is widely agreed that PFM may benefit Tanzania by arresting forest degradation and supporting the development and empowerment of rural communities (MNRT 1998, Petersen & Sandhövel 2001, Wily 2000c, Wily & Dewees 2001). With regard to distributional issues, the effects of PFM are less clear cut and several researchers have argued that restrictions on resource use associated with implementation of PFM may actually adversely affect poor, marginalised and highly forest dependent groups in rural communities (Agrawal & Gibson 1999, Kumar 2002). The importance of addressing this issue is underlined by the fact that alleviation of rural poverty is stated as one of the main targets of the Tanzanian PFM process, and that poverty alleviation in general is a most important policy objective of the GoT, as described in the Tanzanian Poverty Reduction Strategy Paper (PRSP) (URT 2000).

The purpose of this paper is to investigate and discuss the distributional effects of the Tanzanian PFM regime. The investigation draws heavily on field research conducted from February to May 2003 at the Danida funded MEMA-Projects in Iringa District, which resulted in an MSc-thesis on socio-economic aspects affecting PFM in Tanzania (Boiesen & Lund 2003).

As the field research for the MSc-thesis was carried out in an area where PFM is implemented in miombo woodlands, this paper will focus exclusively on this forest type, although it is recognised that the effects of PFM in relation to distributional aspects may be much different in areas of evergreen forests where PFM may be implemented in Central or Local Government Forest Reserves. Even so, the relevance of considering the miombo woodland forest type is accentuated by the fact that it is by far the dominating forest type in Tanzania, covering 90 per cent of the forested area (Wily & Dewees 2001). Furthermore, PFM is currently implemented in several other Sub-Saharan countries, in which the vegetation type designated miombo woodland covers around 2.7 million km^2 and supports the energy consumption of more than 50 million people[2] (Campbell *et al.* 1996, Wily 2000a, Wily & Dewees 2001). In this overall process, learning from the experiences in Tanzania is relevant, as the PFM process, especially concerning legislation, has come far in this country in comparison with the other Sub-Saharan countries (Wily 2000a; 2000b; 2000c).

1.1 PFM in Tanzania

Tanzania has a forested area of around 33 million ha, 90 per cent of which is dry woodlands of the miombo type. The remaining ten per cent consists mainly of coastal and inland evergreen forests some of which have been recognized as unique in terms of biodiversity and density of endemic species (Wily & Dewees 2001, Frontier Tanzania 2001).

Approximately 45 per cent of the forested area is reserved as either Central Government Forest Reserves (CGFRs) under the jurisdiction of the Forestry and Beekeeping Division (FBD) or Local Government Forest Reserves (LGFRs) under the jurisdiction of District Forest Officers (Wily & Dewees 2001). During the entire post-colonial period the forest resources in these reserves have been exposed to uncontrolled extraction activities, as the GoT has lacked the capacity to properly enforce the rules governing extraction (Wily 1998, Wily & Dewees 2001). The remaining 55 per cent of the forested area is almost entirely composed of miombo woodland on general or village land, the majority of which is *de facto* open access resources (Malimbwi *et al.* 2000, Wily & Dewees 2001).

With the passing of the National Forest Policy of 1998 and the New Forest Act of 2002, devolution of ownership and management responsibilities over forest resources has become official policy of the GoT (MNRT 1998, URT 2002). Under the jurisdiction of the New Forest Act of 2002, villages and other local communities can obtain lease rights over CGFRs and LGFRs through Joint Forest Management (JFM) or create their own forest reserves on general or village land through Community-Based Forest Management (CBFM).

As of 2001, a total of 1,502 forest reserves, managed by local villages or communities and covering approximately 323,000 ha, had been founded (Wily & Dewees 2001). This figure does, however, not include the MEMA-Projects, by which an additional forest area estimated at 60,000 ha has been brought under local management (MEMA 1999a; 1999b).

1.2 PFM and poverty

Tanzania is one of the poorest countries in the world. On the latest Human Development Index (HDI) Tanzania is placed as number 160 of 175 countries in the survey, but judging by Gross Domestic Product (GDP) per capita, Tanzania is placed second last (UNDP 2003). Based on a number of variables including life expectancy, adult literacy rate, and GDP per capita, the HDI reflects to some degree the general perception that poverty is an extremely complex phenomenon, which cannot be measured by income only. In line with this the Tanzanian PRSP distinguishes between income and non-income poverty (URT 2000). While income poverty measures concern only the individual or household income, non-income poverty measures take into account other indicators of poverty, i.e. education, survival, nutrition, access to drinking water and social well-being (URT 2000). In relation to PFM these various expressions of poverty are very relevant to consider, as PFM affects poor people in a number of ways e.g. the availability of wild fruits and vegetables which have been shown to contribute significantly to the diet of rural poor households (Cavendish 1998).

It is widely agreed that poverty levels are strongly linked to access and ownership of assets (Ellis & Bahigwa 2003, Ellis & Mdoe 2003, White 2002, Wunder 2001). Assets can be defined as something that can be put into productive use or consumed, which in relation to forests covers, in principle, all forest products and forest land. Analysis of poverty effects of PFM should therefore consider any changes in availability of the assets related to forests, as a consequence of the implementation of PFM. In addition to this, analysis of the poverty effects of PFM should consider the potentially very different effects on community and household levels. While poor rural communities may benefit greatly from increased revenue bases as a consequence of PFM, the poor and marginalised households within these communities may well be adversely affected by restrictions on their access to forest resources.

The importance of forest resources in relation to rural poverty has been accentuated by numerous researchers (Cavendish 1998; 1999; 2000, Luoga *et al.* 2000, Monela *et al.* 1993; 2000). A number of studies have indicated that poor households within rural communities obtain a larger share of their total income from natural resources than more well off rural households and further that poor households are highly dependent on forest resources for subsistence products, especially in periods of adverse climatic conditions when agricultural activities cannot support their livelihoods (Cavendish 1998; 1999; 2000).

In recognition of the dependency of rural poor on forest resources, the question has been posed whether PFM actually affects poor and less powerful community members adversely, as they (1) stand less chance of affecting the rules governing appropriation of the resource and (2) potentially are adversely affected by restrictions on access to the forest resources. A number of studies indicate that under some circumstances rural poor are negatively affected by the implementation of PFM (Agrawal & Gibson 1999, Kumar 2002). However, as introduction of PFM affects local communities with regard to poverty on more levels and in a number of ways, it seems necessary to leave behind any generalising statements and judge poverty effects of PFM on a case-by-case basis.

In Tanzania one must distinguish between different forms of PFM, but also between differences in resource bases, degree of commercialisation of forest products and institutional setups. Large differences exist between JFM implemented in areas of evergreen forest comprising large biodiversity and catchments values, and CBFM implemented in miombo woodlands on village land, where biodiversity levels are low, while large values are related to livelihood diversification possibilities and woodfuel products. Within woodland areas it is necessary to distinguish between areas with differing

market access and resource status. In areas with good resource status and market access there is a good chance that poor rural communities can benefit from PFM by the possibilities of providing immediate tangible benefits in the form of forest revenue collection, while the interests of poor households within the community are safeguarded by retaining an open-access regime for subsistence products. A very different situation may prevail in areas with poor resource status where the poor groups in a community risk suffering from restrictions imposed on appropriation of forest products for subsistence use.

2 Presentation of case study

The field study on which this paper draws was conducted in Iringa District in the Southern Highlands of Tanzania. In the Nyang'oro Range and the Kitapilimwa area in the miombo woodlands north of Iringa town, the MEMA-Projects have worked together with 15 villages with the purpose of developing and implementing PFM. The tenure on these forest areas varies, as the woodlands in the Nyang'oro Range are situated on public land, while in the Kitapilimwa area a CGFR called Kitapilimwa Forest Reserve and five woodlands situated on village land have been included in the projects.

Generally, the woodlands in the area surrounding Iringa town are in fairly good condition compared to areas surrounding other larger Tanzanian towns (Boiesen & Lund 2003). However, degradation is currently taking place in some areas mainly as a result of the urban demand for woodfuel from the 107,000 inhabitants of Iringa town (Koppers 2002). Although there is some variation in climatic and soil characteristics within the project areas, the woodlands can be roughly characterised as dry miombo woodlands receiving less than 1,000 mm of rain annually (Frost 1996). Some topographic variation exists within the project areas. While the Kitapilimwa area is slightly undulating with gentle slopes, the Nyang'oro Range gives rise to more steep slopes. Both areas are elevated between 1,200 and 1,800 metres above sea level implying that the mean annual temperature is rather low compared with the lowland areas of Tanzania.

The woodlands in the Nyang'oro Range cover approximately 36,000 ha of public land in the northern part of Iringa District. For management purposes the Nyang'oro Range has been divided into a southern and a northern part, and two management plans have been prepared for these areas by Zonal Planning Committees (ZPC)[3] (FBD 2001b, FBD 2001c). The villages are now managing the two parts jointly in two groups. Kitapilimwa FR covers an area of 3,699 ha just north of Iringa town and was declared a Forest Reserve in 1952 (FBD 2001a). Five of the six villages managing the Kitapilimwa FR under a JFM agreement have been assisted by the district in declaring a Village Land Forest Reserve (VLFR) on their respective village land areas.

For the purpose of managing the woodland areas all fifteen villages have formed Village Natural Resource Committees (VNRC) the members of which have been elected by the Village Assemblies. Within the VNRCs a chairman, secretary, accountant, interview chairman, and four patrol guards have been elected. So far, the main tasks of the VNRCs in relation to forest management have been patrolling of the woodlands, revenue collection and information on PFM to the villagers.

The fifteen villages range from around 1,500 to 3,000 inhabitants and the primary economic activity is smallholder agriculture. The main subsistence crops are maize, cowpea, beans and groundnuts, while tomatoes, sunflower and tobacco are the most important cash crops. Mono-cropping of maize is the dominating agricultural system, although some intercropping with beans takes place. Bamboo is

encountered everywhere, scattered over the fields. Some Wamasai are living as pastoralists in the areas, and generally livestock is an important part of the agricultural system as many of the households use animal traction for field preparation (COWI 1999).

The main forest related production activities are charcoal burning, firewood collection and pit sawing. Charcoal production is especially important in the villages situated in the southern part of the project area, within market distance of Iringa town for woodfuel products. Furthermore, large amounts of firewood are collected in the village of Migoli, where curing of fish from Mtera Dam[4] is an important local industry. In addition to these activities a number of non-wood forest products (NWFPs) are collected in the woodlands, including stones, gravel, sand, honey, mushrooms, thatch grass, medicinal plants, wild fruits and vegetables (COWI 1999).

For the purpose of interviewing appropriators of forest products, the village of Mfyome was chosen as a case study area. Mfyome village and Mfyome VLFR are located in Iringa District 25 km north of Iringa town in Kalenga Ward in Kalenga Division. The woodland area that forms Mfyome VLFR covers 6,065 ha.

2.1 Methodology

The study focused on quantifying the overall revenue collection for forest products by investigating the VNRC accounts that had been submitted to the District Lands, Natural Resources and Environment Office (DLNRO) by the fifteen villages implementing PFM in the woodlands north of Iringa town. Each month every village is required to submit all permits, receipts and vouchers along with a monthly summary report in which the revenue collection and spending during the month are summarised. Although rather fragmented, these accounts provide a unique picture of the composition of revenue in terms of products extracted in addition to information about the extractors, as every receipt shows the name and origin of the extractor.

In addition to the information from the VNRC accounts the actual extraction rate from Mfyome VLFR was sought quantified in Mfyome village through interviews with commercial forest users in Mfyome village: charcoal burners, firewood sellers, brick burners, pombe brewers, pit sawyers and tobacco growers. Along with interviews with traders from Iringa town going to Mfyome and other places to collect woodfuel, the interviews with the village based producers served the additional purpose of revealing the patterns of trade in forest products. By this, the interviews provided background information and verification of the VNRC accounts.

3 Findings

The main changes in relation to poverty issues that have occurred in the fifteen villages implementing PFM are changes in the rules governing access to and appropriation of forest resources and changes in the forest revenue collection and distribution.

3.1 Rules governing access to and appropriation of forest resources

Every village has divided its woodland area into zones of different management purposes whereby degraded areas and catchments areas have been declared protection areas, in which grazing and extraction of wood has been banned, while collection of NWFPs is still allowed. As a consequence of the fairly good resource status observed in the area, all villages have demarcated production zones in which extraction of all forest products for both subsistence and commercial use is allowed.

In all fifteen villages collection of firewood and most NWFPs for subsistence use requires neither permit nor fee. Although Table 1 states that a fee must be paid for all poles, charcoal, grass and straws, the VNRC accounts from the fifteen villages show that fees are only demanded for these products if they are collected for commercial purposes or by outsiders to the village. However, some indirect uses of natural resources for subsistence use are taxed, such as grazing and fishing for which an annual fee of Tshs 5,000 corresponding to USD 4.42[5] must be paid (FBD 2001a; 2001b; 2001c).

A fee must be paid for all forest products collected for commercial purposes. However, some commercial production, e.g. pombe brewing for the village market, is considered a subsistence purpose in this respect (Boiesen & Lund 2003). All trees for sawn timber, canoes, beehives, and carvings are taxed, as is any charcoaling and collection of firewood or NWFPs for commercial purposes (FBD 2001a; 2001b; 2001c). The fee rates for different forest products decided upon by the villages vary between the management areas and their ranges are shown in Table 1.

Table 1: Fees for appropriation of forest products in the fifteen villages north of Iringa town.

No.	Services/Resources	Unit	Fee (Tshs)	Fee (USD)
1	Charcoal	1 bag	500 - 700	0.44 - 0.62
2	Dry firewood for business	1 lorry	10,000 - 12,000	8.83 - 10.60
		1 cart	500 - 1,000	0.44 - 0.88
		1 headload	50	0.04
3	Mushrooms for business	1 tin	50 - 100	0.04 - 0.08
4	Poles for building	1 piece	50	0.04
5	Wood for timber	1 tree	5,000 - 50,000	4.42 - 44.16
	Wood for canoe, beehive, stools	1 tree	5,000	4.42
6	Tourism	1 day	5,000 - 10,000	4.42 - 8.83
7	Scientific research	1 day	5,000 - 10,000	4.42 - 8.83
8	Sand, Stones			
	- Visitors	1 lorry	3,000	2.65
	- Villagers	1 lorry	500	0.44
9	Straws for baskets and mats	1 head load	50	0.04
10	Grass	1 head load	50	0.04
11	Pasture (herd)	1 year	5,000	4.42
12	Visitors	1 day	10,000	8.83
13	Traditional medicine			
	- Visitors	1 year	10,000	8.83
	- Villagers	1 year	5,000	4.42
14	Fishing (canoe)	1 year	5,000	4.42

Source: (FBD 2001a; 2001b; 2001c)

In addition to the taxation of commercial forest products some forest related activities have been totally banned by the fifteen villages. These activities are: clearing of woodland for agriculture, settlements within the woodland, honey collection, and starting a fire (FBD 2001a; 2001b; 2001c).

In relation to offenders to the rules of the management plans, these state that any illegally appropriated forest resources will be confiscated and the offender fined. Fines for performing activities that are totally banned have been set at USD 44.16, while fines for appropriation without having obtained a permit and/or paid the fee range between USD 0.44 and USD 44.16, with higher rates for outsiders than for villagers (FBD 2001a; 2001b; 2001c). During the field study in the village of Mfyome, interviews with the VNRC and the Village Chairman revealed that the *de facto* system of punishing offenders to the rules takes into account whether the offender is poor, a repeated offender, did the offence on purpose etc.

Although the implementation of PFM in the fifteen villages has affected the availability of forest resources, it can be questioned whether the regulations have adversely affected the poor groups in the villages. The regulations that affect the rural poor the most may be the restrictions on clearing of woodland for agriculture and of course the taxation on certain forest products, as it is assumed that these rules are enforced more strictly than in areas without PFM where similar regulations are in

principle in place. However, save the banning of honey collection all appropriation of forest products for subsistence use is allowed and free of charge, although it is disturbing that this principle is not founded in the management plans, rather than being vested in the informal institutions of the villages.

3.2 Forest revenue collection and distribution

The change in revenue collection as a consequence of the implementation of PFM in Tanzania has provided village governments with an opportunity of improving their revenue base. Table 2 shows the amounts of forest revenue collection registered by the fifteen villages since June 2002 when the collection commenced. The total registered revenue collection indicates that under the current efficiency of collection the fifteen villages collect approximately USD 8,800 annually, corresponding to an average annual collection per village of approximately USD 618[6]. Large inter-village variation exists in the amounts registered, as the estimated annual collection ranges from around USD 88 to 1,987. Variation in revenue collection may be explained by differences in resource characteristics, market access for woodfuel, local wood-consuming industries, and institutional factors.

Table 2: Status of the revenue collection for the fifteen villages after 14 months (NA denotes Not Available).

Village	No of months - receipts	No of months - monthly reports	Total income (USD)[7]	Estimated annual income (USD)[8]	Share of revenue from external sources[9]	Share of revenue spent on public goods[10]
Itagutwa	12	11	500	500	0.61	0
Kinywang'anga	12	11	364	336	0.66	0.09
Kitapilimwa	4	6	49	84	0.42	0
Kiwele	9	9	527	790	0.65	0.03
Mfyome	8	11	1,116	1,218	0.64	0.02
Izazi	5	7	646	1,108	0	NA
Makatapora	2	5	353	605	0	0
Makuka	3	0	77	308	0	NA
Migoli	14	13	2,321	1,989	0.03	0.09
Chamdindi	1	9	184	246	0	0
Ikengeza	0	10	170	204	NA	NA
Mangawe	13	11	378	349	0.21	0
Mkulula	0	7	461	790	NA	NA
Nyang'oro	8	11	353	385	0.08	0
Usolanga	3	14	165	141	NA	NA
Average[11]	6.3	9.0	511	604	0.25	0.04

Columns two and three in Table 2 show the number of months in which the villages have submitted receipts and monthly reports to the DLNRO. Large variation exists in the dedication with which the villages have taken on this duty, and there is a tendency that the villages with large revenue bases have been the most dedicated.

The upper five villages in Table 2 (Itagutwa, Kinywang'anga, Kitapilimwa, Kiwele, and Mfyome) are all situated in the Kitapilimwa area within 30 km of Iringa town. The VLFRs of these villages are within market distance of Iringa town for woodfuel products, i.e. charcoal and firewood, which is reflected in the high shares of external sources of forest revenue. Studies indicate that a common feature of the trade in woodfuel in Tanzania is that traders buying woodfuel from the producers in rural areas to sell it in urban markets pay the fees, and further that the producer price stays unchanged irrespective of the taxation regime (Boiesen & Lund 2003, Malimbwi *et al.* 2000)[12]. An important implication of this is that villages within market distance for woodfuel from urban centres experience a positive inflow of cash when implementing PFM. It is, however, also obvious from the steeply declining share of registered revenue collection from external sources when the distance to larger urban markets increases, that only villages with forest resources within market distance will benefit in this manner. Concerning differences in resources, the villages of Kiwele and Mfyome, with VLFRs of more than 5,000 ha, have by far the largest forest resources of the five upper villages in Table 2, while Itagutwa, Kinywang'anga and Kitapilimwa have VLFRs of less than 1,000 ha. The fact that the magnitude of this difference in forest resources is not entirely reflected in the amounts of revenue

collected may be partly attributable to institutional factors, as both Kiwele and Mfyome have been troubled by problems of elite capture and embezzlement (Boiesen & Lund 2003).

Among the ten lower villages in Table 2 those with large revenue bases (Migoli, Makatapora, and Izazi) are all situated on the banks of Mtera Dam, and the VNRC accounts do also reveal that a large share of their revenue stems from fishing licences, fees for trees for canoes and firewood for fish curing. This serves as an indication that the presence of local wood consuming industries provides villages that are implementing PFM with immediate tangible benefits in the form of a relatively large revenue base. The remaining seven villages all share the same good resource status as the previously mentioned eight villages, but are without or with only limited market access and local wood-consuming industries.

Generally, the figures shown in Table 2 do not provide an exact picture of reality, as the data are rather fragmented. The reasons may be that the villages have only recently learned about PFM and started collecting revenue and they therefore require some time to adjust to the new situation. However, the field study revealed that a part of the difference between registered and *de facto* taxation is due to systems of informal payments (Boiesen & Lund 2003). By quantifying the extraction from Mfyome VLFR on the basis of interviews the field study indicated that the registered revenue collection in this village corresponds to a taxation rate of approximately 20 per cent. Although this is a major increase from the taxation rate of 2-3 per cent achieved by the district authorities[13], the result indicates that in some areas it might be possible to further increase the amounts of revenue collected by the villages. Besides providing tangible benefits for the village level managers and potentially for the entire village community, this local revenue collection may benefit the district budgets, as a share of the collected revenue is sent to the district authorities[14].

Although clearing of woodland for agriculture has been banned by the VNRCs, the receipts show that in two villages a total of 12 acres of forest have been cleared for agriculture, for which fees amounting to USD 48 have been paid. This can be interpreted as an indication that the VNRCs are actively managing the woodlands and have decided to provide a few people in need of land with an opportunity, which is in good accordance with the overall principles of PFM – advocating both rural development and environmental protection.

As can be seen from Table 2 in some areas the earnings from forest revenue collection are of a magnitude that substantially strengthen the revenue base of village governments and thus provide them with an opportunity to finance public goods for the benefit of all villagers[15]. As the last column of Table 2 indicates, this potential has as yet not been realised, as only a mere 4 per cent of registered revenue collection has been spent on public goods. Instead most of the revenue is spent on compensating the managers. In all villages some revenue is spent on compensating members travelling to Iringa town to acquire receipt books etc., but in the villages with larger revenue bases the majority is spent on allowances. Especially allowances for patrol guards and committee members swallow a large share of the revenue collected. Allowances for patrol guards vary between USD 0.18 and 1.77 per patrol, which is in the same range as allowances for committee members attending meetings. In some villages allowances are also paid to the secretary for filling out the monthly summary report, to the interview chairman performing weekly interviews with villagers on their perception of the condition of the forest, and to the patrol guards for accompanying traders into the forest to collect forest products. There is a clear tendency that in villages with large revenue bases the managers are compensated to a much higher degree than in villages with a smaller revenue bases.

Examples of public goods that have been financed by forest revenue are: a water pipe from Migoli to Izazi, contribution to a secondary school, and allowances for seminars on techniques of fire management and grazing. Although the income weighted average of 4 per cent of collected revenue currently being spent on public goods is rather low, this share might be raised in the future as village councils become aware of the magnitude of this new source of revenue. During the first year of revenue collection the levels of transparency and accountability concerning administration of collected revenue have been low (Boiesen & Lund 2003). If a higher degree of transparency and accountability can be achieved it is likely that larger shares of collected revenue will benefit all villagers.

The 4 per cent of registered revenue collection spent on public goods would be a much higher figure if it was measured against registered expenses, as much revenue is unaccounted for in the expenses of the VNRCs. It seems that four villages from the Kitapilimwa area have opened bank accounts in Iringa town, but the VNRC accounts do not reveal information on any deposits. Still, it is strongly believed that the lion's share of the unaccounted for revenue has been spent, and further that when unaccounted for in the vouchers the revenue has been spent on allowances and smaller expenses rather than larger investments in public goods. Therefore it is believed that the 4 per cent comprises a reasonable estimate of the share of expenses that has been spent on public goods.

Although the share of revenue that is used to finance investments in public goods in the villages is rather low, the amounts of revenue collected indicate that woodland resources in areas with market access for woodfuel products hold a large potential in this area. The effects of revenue collection with regards to poverty on community and household level are, however, very difficult to distinguish, as local conditions are very decisive for the results.

4 Discussion

The findings presented in this paper indicate that the effects on rural poverty depend very much on the situation of the woodland in relation to markets for woodfuel products, the size and state of the woodland, presence of local industries and institutional relationships. In the field study area the resource status is good in all areas, but large variation exists with regard to market access, local industries and size of the resource.

The case study village Mfyome and its VLFR represents the optimal situation for implementation of PFM, in which poverty effects depend on (1) whether village based producers or town based traders pay the taxes on forest products (assuming that the producer price stays unchanged), (2) which income group the village based commercial producers of forest products belong to, and (3) in what way the collected forest revenue is spent. As mentioned previously, there are indications that the traders bear the burden of the taxation, which implies that PFM induces a positive cash inflow into the village. Furthermore, if it is believed that village based commercial producers of forest products typically are found in average or above average income groups in a village, then PFM may actually benefit the poor, as the forest is preserved from exploitation by well off villagers and relatively rich town dwellers to the benefit of the poor who depend on it for subsistence products. Unfortunately the literature does not provide much evidence on the income status of commercial charcoal and firewood appropriators. However, the field study in Mfyome revealed that usually the traders pay the fees. The village based appropriators who are operating as small traders either own or are capable of renting donkey carts or bikes, which indicates that they do not belong to the poorest groups of households in the village. Furthermore, due to the capital-intensive growing techniques it seems a plausible

assumption that villagers who are either growing the capital-intensive crop of tobacco or curing fish for sale do not belong to the poorest groups. Regarding (3) it seems there is a need to create a very transparent system in relation to the revenue collection and spending, although the fact that the transactions are taking place in the village in close proximity to the potential beneficiaries may in time assure that the revenue is spent in a fair manner (Blair 2000).

The findings from Mfyome are circumvented in areas with poor resource status where it is necessary to tax or in other ways restrict extraction of forest products for subsistence use. In such areas PFM will potentially affect poor households in a community adversely unless care is taken for them in the design of regulations. However, in areas with good resource status and local wood consuming industries PFM might benefit poor groups within the community, as the woodland is preserved from degradation and a large revenue base is created, which can potentially benefit the poor through investments in public goods. In areas without any commercial utilisation of the woodland resources, however, the benefits of PFM in relation to poverty seem rather vague. In such areas, the need to implement PFM arises due to high demand for (1) land for subsistence agriculture or (2) woodfuel products for subsistence use. In both situations PFM may, through economic incentives (taxation) and increased awareness, induce a more wise use of the woodland resources and thereby relieve the pressure on the resource. However, few immediate tangible benefits for the rural communities may be obtained from the implementation of PFM in such areas.

An overall conclusion on the findings from the study is that PFM seems to benefit rural communities the most in areas with market access for woodfuel products to a larger town. Although this might seem to limit the applicability of PFM it must be remembered that it is in these areas with access for woodfuel products that the need to arrest forest degradation is greatest. Furthermore, depending on the size of the market and the state of the surrounding forest resources the market distance for woodfuel can extend very far implying that a large number of villages can potentially benefit from this aspect of PFM (Boberg 2000, Hofstad 1997, Monela *et al.* 1993). In addition, it seems obvious that more forest revenue will benefit village communities with PFM than without, as (1) the taxation rate may be raised substantially[16], (2) the funds stay in the villages rather than disappearing in the districts' budgets, and (3) the villagers' possibility of assuring that the funds benefit the entire community is improved, as the funds are collected and distributed in the village.

The issue of transparency and accountability has been recognised to be a core problem in decentralisation processes all over the world (Blair 2000, Ellis & Mdoe 2003, Petersen & Sandhövel 2001). In the case of PFM in Tanzania, however, it is important to remember that even though a large share of the forest revenue collected by the VNRCs is spent on allowances rather than public goods, this share may benefit the other villagers indirectly, if a share of the allowances is spent in the village. A more serious problem in relation to PFM is the presence of systems of informal payments. During the field study it became clear that corruption was widespread on village level, with traders and appropriators giving informal payments to village officials. It seems straightforward that poor and powerless groups are at risk of being adversely affected by the presence of such informal systems.

Another problem in relation to poor and powerless groups in village communities implementing PFM is the choice of the village as administrative unit. Villages in Tanzania often consist of several geographically dispersed sub-villages, which differ with regard to socio-economic variables. There are tendencies that sub-villages situated distant from the main village receive less information, are underrepresented in the management bodies and at risk of being adversely affected by the

management decisions made by managers from the main village (Boiesen & Lund 2003, COWI 2002).

In addition to the direct poverty effects in terms of a higher real taxation of forest products and a potentially larger supply of public goods, PFM may affect rural poverty indirectly through the possible preservation or improvement of the forest resource status. With reference to the numerous papers documenting how forest resources benefit the poor this is seen as a definite good in relation to poverty alleviation[17]. This seems a large benefit in areas where the degradation of the resource is performed by agents who are external to the village community, which Boberg (2000) demonstrates is the situation in some areas where charcoal is being produced by professional producers, who are employees of a town based trader. In such situations implementation of PFM is a definite good in relation to poverty alleviation, as poor rural communities are supplied with a legal claim to their woodland resources. Another indirect effect of preserving forest resources adjacent to larger towns is that it may alleviate market imperfections, as the small participants on the woodfuel market using bikes and carts can keep up competition levels to the benefit of small street vendors selling woodfuel products in small portions to urban poor[18]. Another indirect poverty related issue in relation to PFM is that it can be perceived as democratic and financial decentralisation, which empowers rural communities to assist themselves. In relation to this it is possible to imagine district budgets being relieved as villages become capable of financing public goods by themselves and as the districts receive their share of the improved revenue collection. This raises the important question of revenue distribution between the village and district levels. It is important that a suitable distribution is found, as forest revenue forms a strong incentive in the implementation process on both village and district levels.

5 Conclusion

The investigation of poverty effects of PFM in Tanzania has revealed that it is important to consider the effects on different levels, as the effects on community level are often very different from those effects on household level. The findings from the field work indicate that in miombo woodland areas on village land with market access for woodfuel products and a good resource status both the community and the poor households within the community benefit from PFM. The attainment of this result does, however, require that high levels of transparency and accountability in revenue collection and spending are achieved, as to ensure that not all revenue is spent on allowances.

In areas with less optimal conditions the poverty effects on community level are very much dependent on a good resource status and the presence of local wood consuming industries. In areas where both are present there is a good opportunity to provide tangible benefits for both managers and the village as a whole. In areas without these characteristics the effects on community level are less advantageous, and in all situations the effect on poor households within the communities will depend on regulations that take their special problems and needs into account.

When this is said it is important to remember that neutral or adverse poverty effects on community and household level do not necessarily comprise strong arguments against PFM, as a situation without PFM might lead to a much worse scenario a few years ahead. This paper, however, reveals that PFM has a large potential with regard to rural poverty alleviation at community level in many areas of Tanzania. The potential on household level are much less clear-cut and rely on a focused effort of forestry extension staff to ensure that the problems and needs of poor households in communities implementing PFM are taken into account in the management plans. It seems that the largest challenge

lies on the institutional level, as sound management practices and access rules, transparency, and accountability are prerequisites for securing good effects of PFM in relation to poverty.

Acknowledgements

First, I thank my good friend John Halfdan Boiesen, who was with me all the way through our MSc-thesis. Then I would like to express my gratitude to the officers and Danida personnel at the District Lands, Natural Resources and Environments Office (DLNRO) in Iringa, who hosted the two periods of field work that formed the basis for this paper. Also I would like to thank Michael Køie Poulsen og Elmer Topp-Jørgensen for their support, and Professor dr. merc. Finn Helles for his comments and corrections. Lastly, I would like to express my deepest gratitude to the villagers of Mfyome and the many traders on the Iringa town woodfuel market, who shared the information on which this paper is founded.

Notes

[1] In this context PFM is used as a joint designation covering all forms of local participation in forest management. For the purpose of this study we denote cases of devolving the entire management responsibility of forest resources to local communities by Community Based Forest Management (CBFM).

[2] The term 'miombo woodland' is a common term for the Sub-Saharan African woodlands type found on nutrient poor soils in areas receiving little, but not less than 700 mm rain annually and dominated by the genera *Brachystegia*, *Julbernardia* and *Isoberlinia* of the legume (*Fabaceae*) family (Campbell *et al.* 1996).

[3] The ZPC consists of the VNRC Chairman and another VNRC member from each of the VNRCs, jointly managing the FR.

[4] Mtera Dam is an artificial lake created around 20 years ago for hydro-electrical purposes. Today it supplies a large share of Tanzania's electricity besides providing the surrounding communities with large amounts of fish.

[5] A conversion factor of 1,132.2 Tshs per USD (08.02.2004) has been applied.

[6] According to UNDP PPP-adjusted average GDP per capita in Tanzania was USD 550 in 2001 (UNDP 2003).

[7] The sum of monthly figures for all the months for which accounts are available. The figures are from either receipts or monthly reports or, when both are available, the average. The figures are from June 2003 – August 2004 and have been summed without any correction for inflation.

[8] Estimated annual income has been calculated as 12*Total income/No. of months with accounts.

[9] The share of external revenue has been found by analysing the zip codes on the receipts for forest products. The estimate is therefore a lower boundary for the share of external revenue, as the field study showed that the traders from town sometimes buy the receipts of the producers (Boiesen & Lund 2003).

[10] Found from analysis of the vouchers submitted by villages to the district. Only amounts for funding of schools, sanitation, improving the village office and other expenses that benefit the majority of villagers have been included as public goods.

[11] The averages of external sources and public expenditure have been income-weighted and the villages with NA have been left out of the calculation.

[12] At first hand it seems strange that the price stays the same irrespective of the taxation regime, but when one considers the complex and arbitrary taxation system accruing to forest products in Tanzania it makes sense, as neither producer nor trader can have any very precise expectations regarding the real taxation (Boiesen & Lund 2003).

[13] Boiesen & Lund (2003) show that the amounts of forest revenue collected in Iringa District by the district's forest officers during the past ten years have on average been USD 8,832 annually, giving a taxation rate of 1-3 per cent.

[14] In the fifteen villages the shares that must be sent to the district authorities have been set at 5-10 per cent (FBD 2001a, 2001b, 2001c).

[15] Boiesen & Lund (2003) compare the forest revenue collection with other village level taxes, some of which have been abolished since then.

[16] See note 10.

[17] This statement is presented in the awareness that some researchers have cast doubt on the role of forests in relation to poverty alleviation, while recognising the important role of forests to mitigate the effects of poverty by serving as 'safety-nets' for the poor (Wunder 2001).

[18] Koppers (2002) show that approximately 40 per cent of the woodfuel market in Iringa town is supplied by traders using bikes and carts, which is a high share compared to the Tanzanian towns surveyed by Boberg (2000). Although Boberg (2000) does not find a direct relation between the absence of small traders and high trader margins, the results from a market survey in Iringa town by Boiesen & Lund (2003) indicate that small traders' are easier to bargain with and earn smaller margins than large traders.

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